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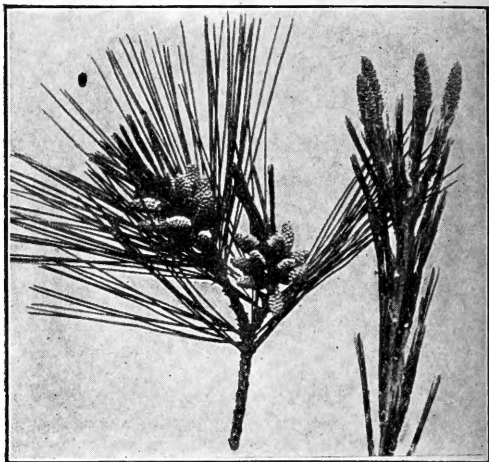
HOW AND WHEN TO COLLECT WHITE PINE SEED



This and next year's crop of cones. Large ones mature and ready for picking.

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The Staminate (male) and Pistillate (female) flowers of the White Pine. These appear a year before the cones develop; hence it is an easy matter to determine a year in advance of a seed crop.

Gift

F. W. Rame

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HOW AND WHEN TO COLLECT WHITE PINE SEED

THE white pine (*Pinus Strobus*) is one of the most common trees found in Massachusetts and New England, and is of great economic and æsthetic value, yet the writer finds that little is known about its method of propagation.

Even teachers and those who have studied botany and nature study, and again farmers and men who have worked in the woods or at the lumber industry all their lives, seem never to have given the matter any thought or definite observation.

White pine is grown from seed only; it does not sprout from the roots when cut, as our hard woods. In replanting our waste and abandoned lands with white pine, the first step is to collect the seed. Some evidently think pine trees come from nothing, or were

White pine
from
seed only

created, perhaps, but this is not the way Nature does things. If we expect an agricultural crop, the kind of grain desired is planted; just so with growing the white pine.

Pine seed comes from the cones which grow upon the pine trees. The cones are

Seed comes from pine cones	more abundant upon trees of twenty years of age or more, and are located near the top of the tree. Old single pasture pines,
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or those growing in clumps or along the edges of the forest, and more or less limbed, commonly called "cabbage pines," are usually the greater seed bearers. These trees, also, are the easier to collect the cones from.

It requires two seasons for the white pine cones to mature. The embryo cone, which

Two seasons for seeds to mature	is the pistillate (female) blossom of the pine, forms in the spring of the year, at which time it is fer- tilized, and can be seen through-
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out that whole season as a small, upright,

so-called "Christmas candle," an inch or so long. When vegetation starts the second season, however, the white pine cone takes on activity, and by August it reaches full size, which varies from four to six inches in length. During this time the seeds form at the base and under the scales. The cones remain green until the latter part of August or fore part of September, depending upon the nature of the season, when they mature and turn brown. When mature, the cones, while still hanging on the tree, open up (spread out their scales) at the first dry period, thus allowing the seeds which have been concealed to drop out. Each pine seed is provided with a delicate wing, in

Seed
scattered
by wings

some respects resembling the wing of a bee, and this assists the seed very much in its distribution.

With scarcely any wind the seeds travel for some distance before they reach the ground, so with a strong gale at time of

shedding, one can imagine how far they may be distributed. The finding of isolated pine seedlings is often accounted for in this way. The prevailing wind at time the cones are opening governs the territory seeded.

If we desire to collect white pine seed, it is important that the cones be collected before they open and lose their seed. This may be done in the latter part of the month of August, any time before the cones open.

There are various methods of collecting the cones, but the best advice is to get them somehow. Picking with a long ladder is one way; another, and one that will recommend itself, is to find out where lumbering is going on, and collect the cones as they fell the trees.

When connected with the New Hampshire College the writer tried a number of

ways of solving this problem. One which worked very nicely was to send about four or five boys up the trees to pick the cones and throw them over the branches to the ground, while another one remained upon the ground and gathered them into bags. The cones may again be gathered by picking and putting directly in a bag which is attached to the shoulder, similar to the manner of picking apples. Old gluten or feed bags, inexpensive and commonly available about farmers' barns, answer very well for this purpose.

The number or quantity of cones that can be gathered in a day will vary as to the yield per tree, method of gathering, etc. As white pine box-boards throughout New England are in great demand, and at a relatively high price, even the old "cabbage pines," full of limbs, a few years ago considered valueless, are at present rapidly going to the

Mother
seed trees

sawmill. These old trees in the past have been the great seed producers and mother trees of our present forest stands. If they are destroyed, however, where must we look for our future pines?

One man, with two assistants, in a seed year spent nearly two days in cutting down about 50 pine trees and picking the cones from them, and gathered two wagon loads, some 50 bushels before the cones were open.

An example in collecting pine seed

When they were dried out and opened, he had fully 100 bushels of cones and nearly 5 bushels of uncleaned seed. His method of drying was to spread them out where the sun could shine on them, raking the pile over often, covering them with a canvas at night and in rainy weather. If the cones get wet they close up. It took in this case two weeks to get the seeds from the cones.



White pine cone with scales open and seed gone.
White pine needles grow in clusters of five.

After the cones are gathered it is not necessary that the seed be secured from them at once. They may be deposited in any dry place, where squirrels or mice are kept from them, and the seed thrashed out later. The practice of using a bag to put the cones in is convenient, for as they open up the bag can be flailed at odd times and the seed falls out into the bottom and is readily collected.

Should one have a greenhouse, it is usually available about the time the cones are ripe, and if they are placed here for a short time, avoiding any moisture for a few days, the high temperature will open the cones very quickly. The writer has made it a practice simply to place the bags in the greenhouse, and then turn and flail them occasionally, when the seed is easily separated. A hotbed or cold-frame sash could be made to serve the same purpose on a small scale.

There are probably many other ingenious ways of extracting the seed from the cones that will occur to different ones which will be equally good.

White pine seed has averaged in price in recent years from \$1.50 to \$4.50 a pound.

Price of seed During the spring of 1907 the price in large quantities was \$3.75 a pound.

White pine seed if given normal conditions, not too moist or excessively dry, retains its vitality for several years.

Vitality retained for years The reason that the seed has been so high is that the demand has increased very rapidly in this country lately, and the few dealers have practically made their own prices.

It is hoped that this brief pamphlet will assist in calling attention to the importance of gathering white pine seed each year, when it is fruiting. We should ultimately consider the im-

Important to collect seed

portance of harvesting this crop, just the same as any other.

The writer would consider it a great benefit to New England, and Massachusetts in particular, if enough people could be interested so that a regular pine seed campaign could be kept up until the seeds of this most important forest tree could be purchased at 50 cents a pound, and it is believed it can be done.

With pine and other forest tree seeds in plenty, at reasonable prices, people generally will begin to start small nursery beds in their gardens and fields, which will in turn give us seedlings and transplants at a much more rational forestry basis than they can be obtained at present.

There are from 20,000 to 30,000 white pine seeds in a pound, and it is customary for nurserymen to plant this amount upon a bec

4 feet wide and 50 feet long. Under normal conditions, which will be described in a forthcoming circular, a person ought to raise 10,000 to 15,000 seedlings on this area. With the above data, and knowing the distance apart that pines are set, usually 5 by 6 feet, one can figure out for himself the cost of growing his own stock of plants.

It has been the endeavor of the writer to tell in a precise and practical way just how and when to collect the white pine seed. It now remains to be seen how many we can get to do something in this line. All persons interested in reclothing our waste lands, and in establishing economic and æsthetic forestry conditions throughout this Commonwealth and New England, will find that practising and impressing the simple beginnings of forestry on others will go far toward an ultimate solution.

Expensive forestry seeds and seedlings are the greatest drawbacks at the present time to beginning forestry work.

Reason
for high
prices

Let us remedy it. There are few seedsmen who handle forest tree seeds, and the comparatively little demand until now has made the business an uncertain one, and hence the prices are high.

If white pine sells for even \$2 a pound, no one cares to sow broadcast five pounds per acre, as is recommended by some seedsmen, as the expense makes the operation anything but practical. No one cares to use five or ten dollars' worth of seed on land that is in itself almost valueless. Collecting the seed one's self, however, obviates this difficulty and makes the conditions more favorable.

There is much inquiry as to how often white pine produces seed. Somehow the Seed year idea is quite firmly established in

the minds of many that a seed year once in seven is a fixed law. From observation there seems to be no definite regularity in Nature. A white pine, like other trees, if it yields a maximum crop one year, is not likely to produce another heavy crop in from three to seven, depending upon the seasons and other conditions. The writer has seen two heavy crops in one locality only four years apart. Examples are not uncommon, also, where a pine tree may be fruiting a fair number of cones and at the same time have embryo cones which are to fruit the following season.

Not all sections of the State are likely to seed the same year, although they may. By inquiry it is found that one section may have a heavy crop, while another may have none. In this way seed usually can be had from some section each year.

The seeds of spruce, hemlock, and other evergreens are collected in like manner as

Seed of the pine. Of course, they vary
 other in size of cone and seed and
 evergreens time of maturity.

Deciduous trees, or hard woods, are also
 easily grown from seed, and when one gets
 interested in collecting and grow-
 Hardwoods ing the white pine, it is only a
 from seed step toward later interest and
 pleasure in the whole forestry question.

We need to cultivate as a people a great
 love for out-of-door life, and there is noth-
 ing that awakens interest and a
 Forests love for Nature herself more than
 and Nature the forests and their associations.

At a later time a companion booklet on
 methods of planting and caring for seedlings
 will be issued.

F. W. RANE,

State Forester

State House, Boston, Mass.,
 August 1, 1907

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